



This slide deck was originally built for live presentation to a nursing pre-requisite class at a local college. Everyone has a stake in the built environment; this focuses on the public health approach. Topics highlighted in speech have been included and animations have been removed. Please share for educational purposes, but do not edit.

Objectives



- Purpose: Recognize community stake in built environment
- Principles: Learn characteristics of built environment that can improve health outcomes

Defining Health



“Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”

-World Health Organization

Constitution of the World Health Organization

Mission



To protect, promote, and improve the health
of all people in Florida through integrated
state, county, and community efforts.

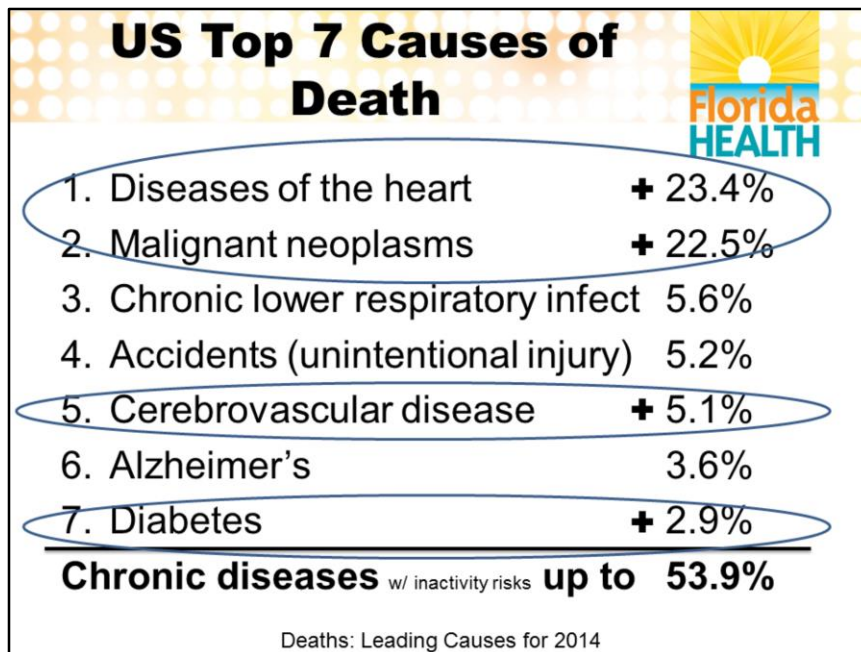
Chronic Disease



The CDC states

- nearly half of US adults have at least one chronic health condition
- 7 of the top 10 causes of death are chronic diseases

CDC Chronic Disease Overview



NIH National Cancer Institute: Obesity may increase risk of cancer in breast, colon, rectum, endometrium, esophagus, kidney, pancreas, or gallbladder.¹ However, it is inaccurate to assume that obesity, inactivity, and lifestyle account for all incidences of cancer or related deaths.

From the cited source: It is also important to note that rankings do not necessarily denote the causes of death of greatest public health importance. Some causes of death of public health significance are excluded from the ranking procedure. For example, Malignant neoplasms of the trachea, bronchus and lung (lung cancer) and Motor vehicle accidents are not rankable causes of death (see "Procedures for ranking causes of death"), although they can be identified using the standard mortality tabulation lists. If these causes were included in the current rankings, lung cancer would be placed among the 10 leading causes of death with a rank of 3rd, whereas Motor vehicle accidents would rank 13th. However, each of these is incorporated into broader rankable categories, namely, Malignant neoplasms and Accidents (unintentional injuries), respectively. Although not perfectly suitable in all circumstances, the current framework provides a rankable list of causes of death that has broad appeal and acceptance in the general public health community.

From Procedures for causes of death: As in the past, vaguely defined categories were excluded from selection as rankable causes. These included the category "Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified" and all categories beginning with the words "other," "all other," "certain other," or "unspecified." Among the remaining cause-of-death categories, decisions were made to select as rankable the causes of death considered most useful from a public health perspective, with the following condition: The rankable causes must be mutually exclusive. If a category containing subcategories (such as Tuberculosis or Malignant neoplasms) is selected as a rankable cause, its component parts are not selected as rankable.

1. NIH National Cancer Institute. Obesity. <https://www.cancer.gov/about-cancer/causes-prevention/risk/obesity>. Accessed June 16, 2017.

Built Environment



All of the physical parts of where we live and work:

- Homes
- Buildings
- Streets and sidewalks
- Open spaces

Purpose



Why do we care about the built environment?

Built environment can also be considered community design

Health Components



Family history



Environment



Lifestyle

Obesity Consequences: Health



- Hypertension
- High cholesterol
- Type 2 diabetes
- Coronary artery disease
- Stroke
- Gallbladder disease
- Osteoarthritis
- Sleep apnea
- Several cancers
- Mental illness
- Body pain from poor function

CDC: Adult Obesity Causes and Consequences

Decreasing the prevalence of coronary artery disease (e.g. heart attack) and stroke are strategic priorities of the Florida Department of Health. Obesity has been identified as a risk factor in many chronic diseases that affect the durability and function of blood vessels- high blood pressure and high cholesterol each increase risk of heart attacks and strokes.

Obesity: National Estimated Costs



- Annual productivity costs of obesity-related absenteeism and presenteeism estimates between \$3.38-6.38 billion

Annual US medical cost of obesity?

\$147 billion (2008)

CDC: Adult Obesity Causes and Consequences

Absenteeism- taking time off work

Presenteeism- physically attending work, but with reduced production due to illness, anxiety, distraction, etc.

**147,000,000,000
dollars?!**



- \$68,450 median nurse salary
- 2,147,553 nurses for 1 year
– 2,751,000 US RNs in 2016

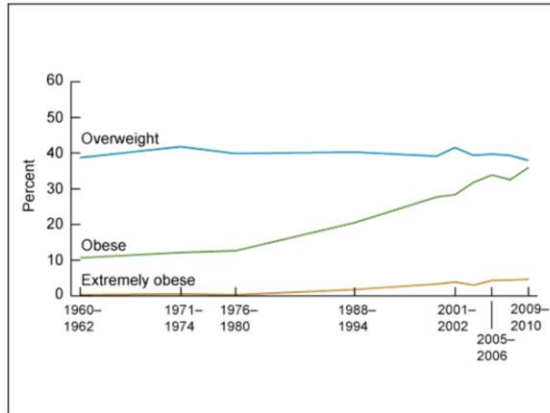
**49,943 nurses' 43-year careers
in ONE year!**

Bureau of Labor Statistics

Obesity trends: Men



Trends in overweight, obesity, and extreme obesity among **men** aged 20–74 years: United States, 1960–1962 through 2009–2010

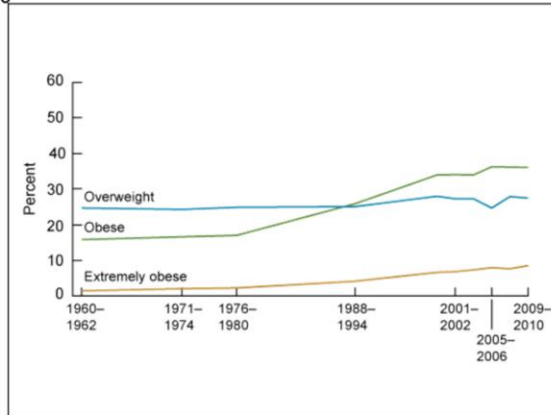


CDC/NCHS, National Health Examination Survey

Obesity trends: Women

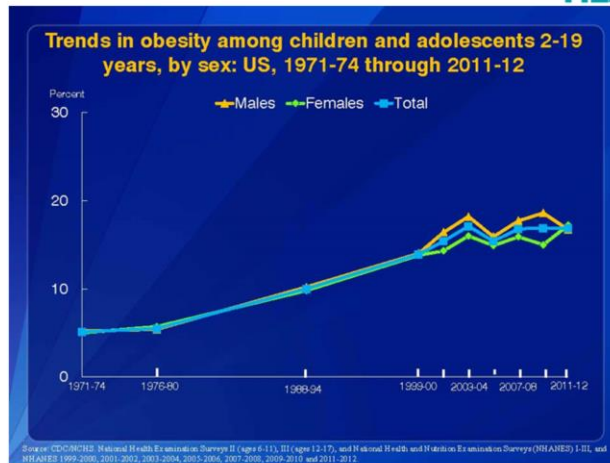


Trends in overweight, obesity, and extreme obesity among **women** aged 20–74 years: United States, 1960–1962 through 2009–2010



CDC/NCHS, National Health Examination Survey

Obesity trends: Youth



Children with Obesity



- Higher risk of
 - asthma
 - sleep apnea
 - type 2 diabetes
 - factors for heart disease
 - depression, isolation, low self-esteem (bullying)
- Linked to obesity and health risks as adult

CDC Childhood Obesity Facts

Obesity Consequences: Health



- Hypertension
- High cholesterol
- Type 2 diabetes
- Coronary artery disease
- Stroke
- Gallbladder disease
- Osteoarthritis
- Sleep apnea
- Several cancers
- Mental illness
- Body pain from poor function

CDC: Adult Obesity Causes and Consequences

Re-emphasis of obesity consequences, giving weight to the tremendous disadvantages children with obesity face.

Physical Activity



2008 federal guidelines for leisure time
aerobic physical activity (adults):

- **≥ 150 min/week** of moderate-intensity
or
- **≥ 75 min/week** of vigorous-intensity

% who met guidelines in 2015:

49%

2015 National Health Interview Survey

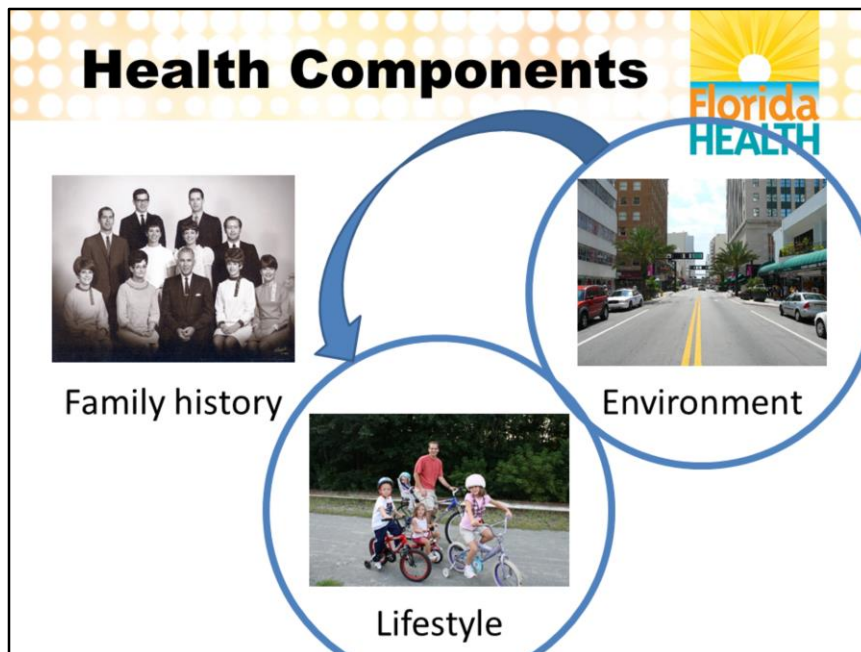
Audiences tend to underestimate based on the tone of the presentation. Use this to give hope, while also comparing to a letter grade scale where A=90%, i.e. it's not as bad as you may think, but it could be much better than 1 in 2 meeting recommendations.

Avoidable?



The Milken Institute projects that with better wellness choices regarding nutrition, exercise, and tobacco, the US can avoid 40 million cases of chronic disease in 2023.

Economic Burden of Chronic Diseases



Family history/genetics are not currently adjustable.

Lifestyle is a combination of individual choices, and can be adjusted with proper motivation, consulting (health coach, personal trainer, dietitian, leadership).

Environment has elements of design that influence the choices, activities, and lifestyles of the people in it. Contains cues on how to use, regardless of awareness.

Intuitive design makes it easier and sometimes accidental to make the healthier and more productive choice.

Example: We interact with doors intuitively by their handles. Interactions usually go smoothly with pull handles and push bars showing us how to use them. However, failed interactions may come as a surprise when the handles are installed

“incorrectly,” or if no indication of direction to open.

Health Components



Environment

Obesity vs Community Design



Land-use mix has strongest association with obesity. Each quartile increase of land-use mix associated with 12.2% reduction in likelihood of obesity

- ↑ land-use mix
- ↑ distance walked (1 km=.62 mi→ 4.8%)
- ↓ time in car (1hr→ 6%)

= ↓ Obesity

Obesity Relationships with Community Design

Each kilometer a study participant walked per day was associated with a 4.8% lower chance of that participant having obesity.

Each hour a study participant spent in a car per day was associated with a 6% higher chance of that participant having obesity.

Physical Activity vs Urban Form



Walkability scores

- land-use mix
- residential density
- intersection density

**Top 25% walkability scores → 2.4x more
likely to get ≥30 minutes exercise/day**

Linking Objectively Measured Physical Activity

Principles



What makes a good built environment?

4 Tests of Smart Growth



1. Popsicle
2. Date/Halloween
3. Kids
4. Seniors



Adapted from NC Smart Growth Alliance

Popsicle Test



Can an 8-year old walk to the store, buy a popsicle, and return home before her popsicle melts?



This highlights accessibility to grocery stores for non-driving populations. Will people without cars be able to transport perishables without having them thaw or reach unsafe temperatures?

Date/Halloween Test



Would you walk with your date or kids?

- Safe
- Visually appealing
- Low traffic noise



Kids Test



Can a child explore beyond the backyard?



Exploring surroundings in a safe location leads to better autonomy.

Seniors Test



Does the environment welcome and engage elder citizens?



Is it accommodating to non-driving populations, people using mobility devices, or people who move more slowly than average?

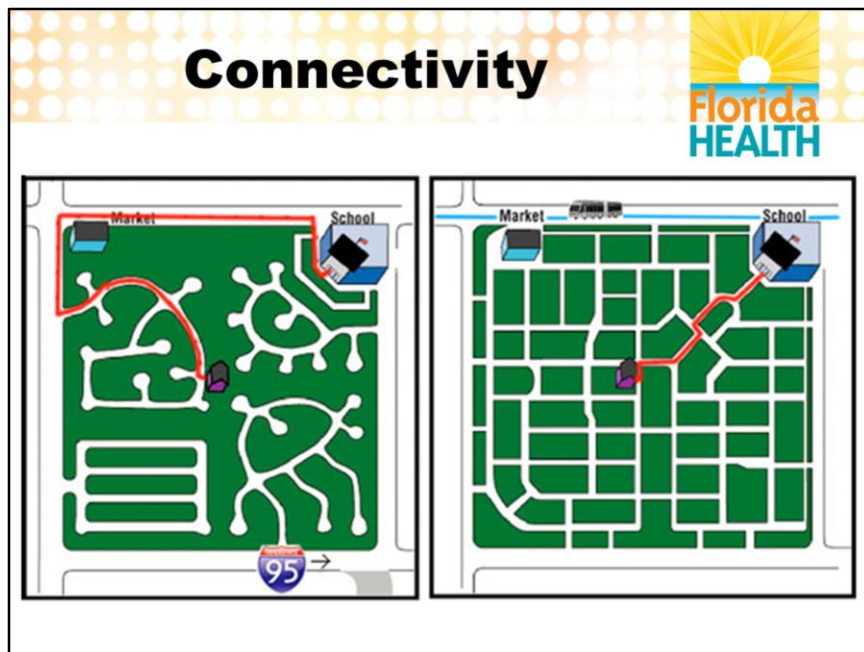
Sense of Place



Unique collection of visual, cultural, social, and environmental characteristics that provide distinction and meaning to a location

Makes our surroundings worth caring about

Neither the audience nor I know what city this is.



Highlight the collection of traffic dumping onto major roadways that contain few intersections, where cars are likely to gain speed. Typical of a gated community. On the right, more ways to travel directly to places of interest. Shorter distance and less exposure to elements= more likely to pass the popsicle test while encouraging non-motorized transit

Parks



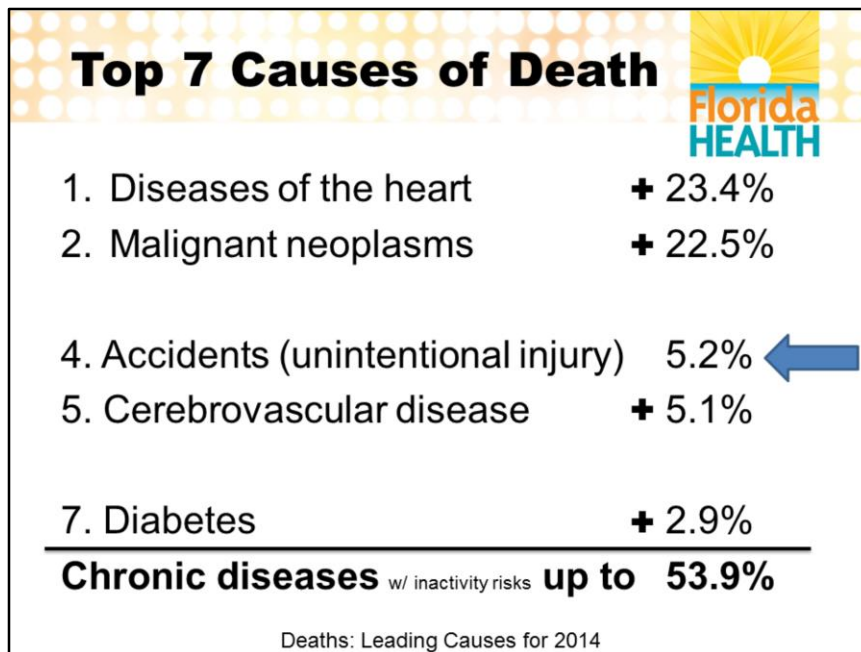
Fredrick Olmsted- famous landscape architect

Park in city? → City in park!

- No main gates
- Access from all sides



Central Park, NYC.



Transition: Up to this point, the presentation has been focused on the built environment affecting lifestyles that reduce risk of chronic disease. However, the built environment also influences accidental deaths, including traffic collisions. This is also a public health concern.

Intersections

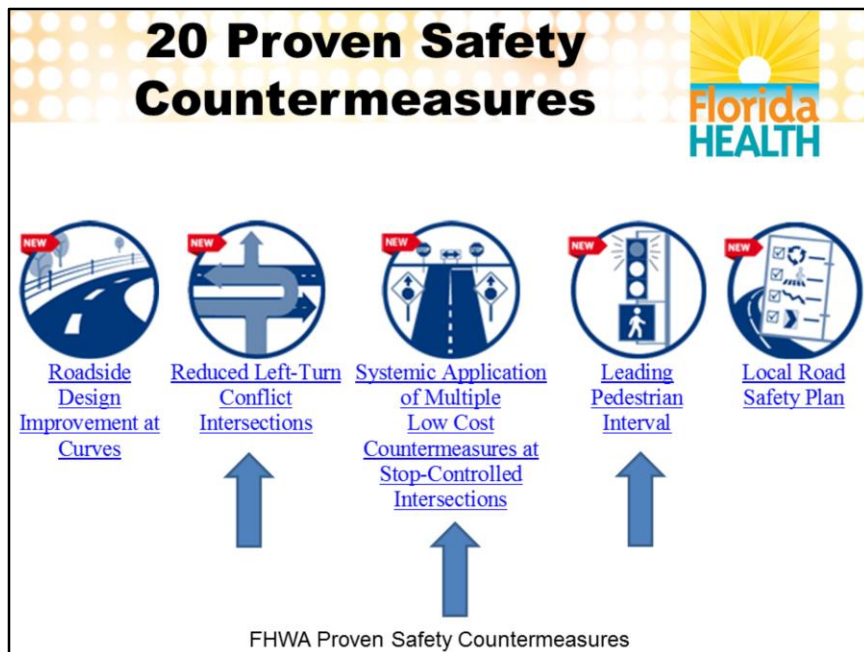


- About 1/3 intersection fatalities at signalized intersections
- 2,300 people each year
 - 700 red light running collisions



FHWA Proven Safety Countermeasures- Roundabouts

- Acceleration at yellow lights
- Misjudging oncoming traffic during left turns
- Cars in oncoming traffic sometimes obscured by other cars
- Multi-directional traffic increasing risk of T-bone and head-on collisions and resulting in more devastating forces and changes of direction
- Timing green lights
- Mistaking signal meanings (unprotected left turn)
- Reading the wrong signal
- Not yielding to U-turn during right on red, etc.



Indicated countermeasures affect intersections

20 Proven Safety Countermeasures



[USLIMITS2](#)



[Enhanced Delineation
and Friction for
Horizontal Curves](#)



[Longitudinal Rumble
Strips and Stripes on
Two-Lane Roads](#)



[Median Barrier](#)



[Safety
EdgeSM](#)

FHWA Proven Safety Countermeasures

20 Proven Safety Countermeasures



Medians and
Pedestrian Crossing
Islands in Urban and
Suburban Areas



Pedestrian Hybrid
Beacon



Road Diet



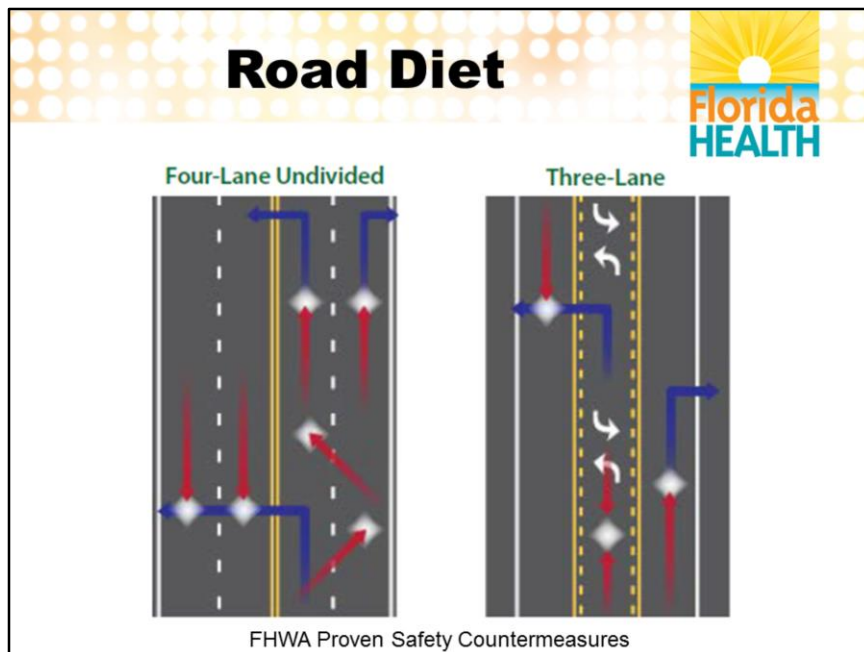
Walkways



Road Safety
Audit



FHWA Proven Safety Countermeasures

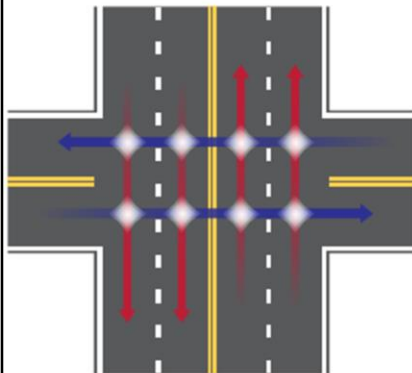


Road diet, also known as lane reduction or road rechannelization. Potential collision points highlighted

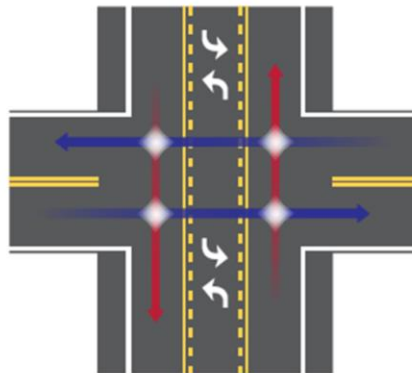
Road Diet



Four-Lane Undivided



Three-Lane

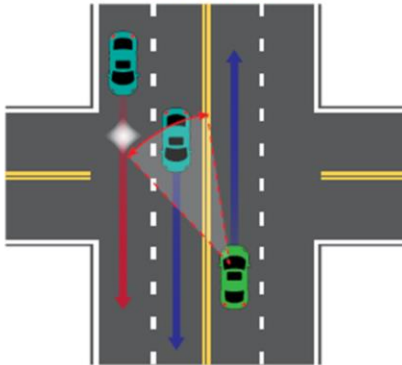


FHWA Proven Safety Countermeasures

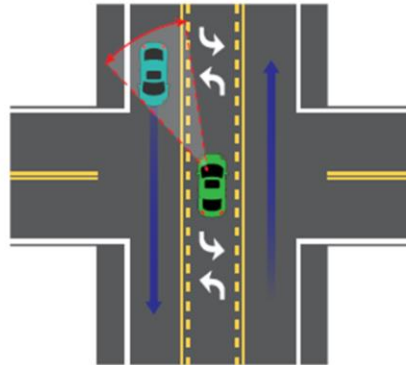
Road Diet



Four-Lane Undivided
(Outside Lane Traffic Hidden by
Inside Lane Vehicle)



Three-Lane
(No Hidden Vehicles)



FHWA Proven Safety Countermeasures

20 Proven Safety Countermeasures



Backplates with Retroreflective Borders



Corridor Access Management



Dedicated Left- and Right-Turn Lanes at Intersections



Roundabouts



Yellow Change Intervals



FHWA Proven Safety Countermeasures

Proven Safety Countermeasures



Roundabouts



Corridor Access Management



Backplates with Retroreflective Borders



Longitudinal Rumble Strips and Stripes on Two-Lane Roads



Enhanced Delineation and Friction for Horizontal Curves



Safety Edge_{SM}



Medians and Pedestrian Crossing Islands in Urban and Suburban Areas



Pedestrian Hybrid Beacon

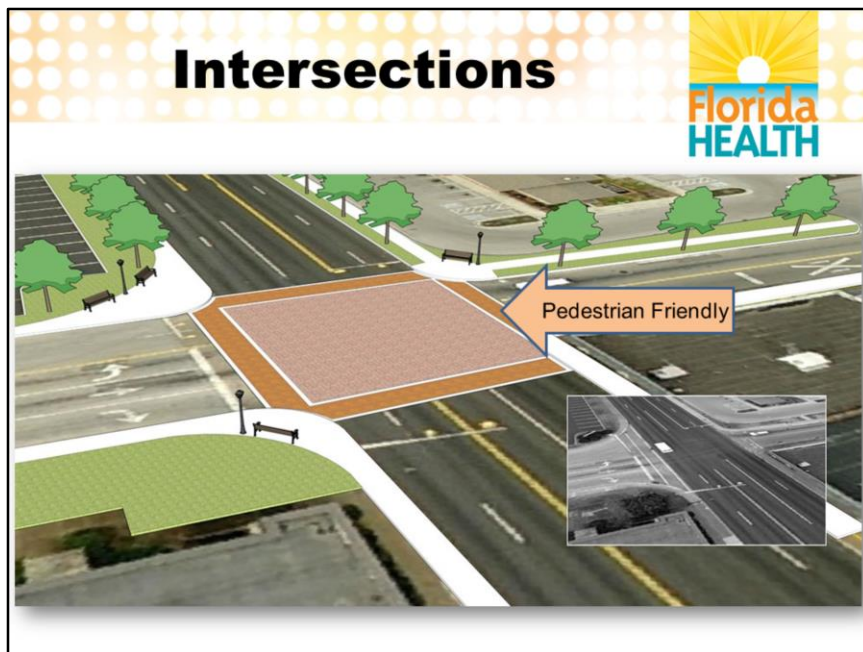


Road Diet

FHWA Proven Safety Countermeasures

Central Ave x 8 St





Inset: long pedestrian time in intersection
Turn invites high speed right turns

Color image: increase curve radius, driver more likely to slow before turning
Colorized intersection increasing visibility
Shade trees and places to rest along walkways make environment more inviting
Bi-directional crosswalks

Features



Sharrows clearly indicate cyclist has right to whole lane

No center line, encouraging cars to take more space in order to pass safely instead of crowding cyclists

Wide crosswalks at each direction of intersection

Mixed Use



Mercato

Mercato is exemplary mixed-use. Residences, grocery, entertainment- most needs accessible nearby without car. Wide, comfortable walking space, safe vehicle speeds



Talk of how it takes a village to raise a child sounds -- and feels -- good but, to make it work, you need a village to start with. Which means you need politicians willing to push it, and developers willing to build it.

-Writer and advocate Scott Doyon

Health educators, community awareness, and...



Changing the landscapes of public health and the built environment need and use multidisciplinary partnerships

Transportation Summit



Courtesy: Blue Zones Project

Naples Mobility Study



Courtesy: Blue Zones Project

What can you do?



Objectives



- ✓ Purpose: Recognize community stake in built environment
- ✓ Principles: Learn characteristics of built environment that can improve health outcomes

Questions?



[DOH-Collier Healthy Communities
Coalition Website](#)

Healthy Communities Coordinator
(239) 252-2594

For more information, please visit the Healthy Communities Coalition website at <http://collier.floridahealth.gov/programs-and-services/wellness-programs/healthy-communities/index.html>, or <http://www.healthycollier.org>

References



- Constitution of the World Health Organization. In: World Health Organization: Basic documents, 45th ed. Geneva: World Health Organization; 2005.
- Centers for Disease Control and Prevention. Chronic Disease Overview. <https://www.cdc.gov/chronicdisease/overview/index.htm>. Accessed May 22, 2017.
- Heron M. Deaths: Leading Causes for 2014. National Vital Statistics Reports, Vol. 65, No. 5, page 9. June 30, 2016 https://www.cdc.gov/nchs/data/nvsr/nvsr65/nvsr65_05.pdf. Accessed June 9, 2017.
- Centers for Disease Control and Prevention. Adult Obesity Causes and Consequences. <https://www.cdc.gov/obesity/adult/causes.html>. Accessed June 8, 2017.
- Bureau of Labor Statistics. Registered Nurses. <https://www.bls.gov/ooh/healthcare/registered-nurses.htm>. Accessed June 8, 2017.
- Obesity charts: CDC/NCHS, National Health Examination Survey I 1960–1962; National Health and Nutrition Examination Survey (NHANES) I 1971–1974; NHANES II 1976–1980; NHANES III 1988–1994; NHANES 1999–2000, 2001–2002, 2003–2004, 2005–2006, 2007–2008, and 2009–2010.
- Centers for Disease Control and Prevention. Childhood Obesity Facts. <https://www.cdc.gov/healthyschools/obesity/facts.htm>. Accessed February 21, 2017.
- Ward, Clarke, Nugent, Schiller. Early Release of Selected Estimates Based on Data 2015 National Health Interview Survey. <https://www.cdc.gov/nchs/data/nhis/earlyrelease/earlyrelease201605.pdf>. Accessed June 8, 2017.

References



- DeVol R et al. An Unhealthy America: The Economic Burden of Chronic Disease -- Charting a New Course to Save Lives and Increase Productivity and Economic Growth. Summarized at <http://www.milkeninstitute.org/publications/view/321>. Accessed May 22, 2017.
- Frank L, Andresen M, Schmid T. Obesity relationships with community design, physical activity, and time spent in cars. American Journal of Preventive Medicine. Volume 27, Issue 2, August 2004, pg 87-96. <http://www.sciencedirect.com/science/article/pii/S074937970400087X>. Accessed June 12, 2017
- Frank L, et al. Linking objectively measured physical activity with objectively measured urban form: Findings from SMARTRAQ. American Journal of Preventive Medicine Vol 28, Issue 2, Supplement 2, Feb 2005 Pg 117-125. <http://www.sciencedirect.com/science/article/pii/S0749379704003253>. Accessed June 13, 2017.
- U.S. Department of Transportation Federal Highway Administration. Proven Safety Countermeasures. <https://safety.fhwa.dot.gov/provencountermeasures/>. Accessed June 9, 2017.
- U.S. Department of Transportation Federal Highway Administration. Proven Safety Countermeasures- Roundabouts. https://safety.fhwa.dot.gov/provencountermeasures/fhwa_sa_12_005.cfm. Accessed June 9, 2017.
- Photo of Mercato. <http://stepstothebeach.com/wp-content/uploads/2013/11/Mercato-Naples-FL.jpg> Accessed June 7, 2017.

Special thanks to Deborah Chesna, FDOT Complete Streets, Growth Management Coordinator